

NOTE UPON YELLOW FEVER IN THE BLACK RACE AND ITS BEARING UPON THE QUESTION OF THE ENDEMICITY OF YELLOW FEVER IN WEST AFRICA

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The question of the susceptibility of the various races of mankind to yellow fever is one which has always attracted considerable attention, and one about which there still exists very great misunderstanding.

The medical authorities on yellow fever in the 18th and 19th centuries held that no races were absolutely immune, with the possible exception of the Chinese. They held strongly, however, to the view that the disease was very rare amongst the native inhabitants of tropical countries, whilst very common on the other hand amongst new arrivals. In other words, the older authorities stated that yellow fever was essentially an acclimatising fever.

Inasmuch as the Latin races were the first to colonise, they were the first to suffer from yellow fever. Thus we have very complete records of continual epidemics amongst the Spaniards, Portuguese and French. So frequent, in fact, were these epidemics that the Latin races were considered more susceptible than the other races.

When, however, the northern races began to colonise, yellow fever proved itself equally virulent amongst them as the records of Dutch, Danish, English, Norwegian and Swedish colonisation and immigration amply testify.

It thus came about that yellow fever was a measure of commercial and maritime expansion, and of labour movements in the various industrial centres in the tropical world.

A period then arrived when, as in the 18th century, medical men observed that the offspring of whites who were born in yellow fever districts later escaped the disease during epidemics of yellow

fever. Then it also became apparent that the size of the epidemics was strictly proportional to the number of new arrivals.

This observation brought out into still greater prominence the fact that the permanent inhabitants of tropical towns did not die in the same proportion as the new comers. These facts were observed over and over again in New Orleans, in the West Indies, in Central and in South America, the most careful tables for comparison being furnished by Rio de Janeiro.

It was therefore concluded that the permanent inhabitants, whether Creoles as in the Southern States and in the West Indies, or Indian-Spanish as in Central and South America, were to a large degree immune, but that they lost this apparent immunity if they went to reside in Europe or a cold climate for a long period. The question why they were immune, however, only attracted scant attention, and at most, shrewd surmises were attempted like those of the great Faget of New Orleans. It was not, in fact, until the mosquito doctrine was firmly established that scientific attention was given to this exceedingly interesting fact.

In the slave trade period, when black labour was introduced into the West Indies, Central and South America, and into the Southern States of America a new series of facts became patent. Sometimes the blacks died in very large numbers from yellow fever, as in the Philadelphia epidemic, but in most cases where we are in possession of reliable figures like those furnished by Chassaingnac, Roche, Lazard, Brady and numerous others, the proportion of deaths amongst the slaves or their descendants was relatively small. It was conclusively shown during the 1905 New Orleans epidemic of yellow fever that the blacks could get yellow fever. Thus Lazard states that in that epidemic there were 452 fatal cases amongst the whites and six amongst the negroes, whilst Chassaingnac observed that the blacks were liable to the disease equally with the whites, but had it in a *particularly mild form*. Chassaingnac's figures are as follows:—

In one series of the observations the mortality amongst ninety white cases was 20 per cent., and amongst 950 coloured cases 1·2 per cent. In another series of 500 cases amongst the whites there was a mortality of fifty-one, and amongst 200 coloured a mortality of one. La Roche states that the mortality from yellow fever in

Jamaica amongst the troops was 102 per thousand amongst the white soldiers, and eight per thousand amongst the blacks. Blair states that of the 1,790 black men imported into Demarara none died of yellow fever during the 1852 epidemic of that disease. The fact was therefore abundantly proved that whilst yellow fever did occur in the blacks, it nevertheless did not assume the same severe type as in the whites; fatal cases did, however, occur from time to time amongst the blacks, and in some epidemics there was a comparatively high sickness rate. It became evident that, therefore, the black possessed no natural race immunity, and that it was only a question as amongst the whites of 'acclimatisation,' that is, of coming from a district or country where yellow fever was rare into a city where yellow fever happened to be endemic.

The new comer, whether black or white, was liable to the disease. In this connection it is interesting to note that Coolies and Chinamen are also liable to yellow fever.

All these are facts which go to prove that the various races of mankind are susceptible to yellow fever, and that there is no absolute racial immunity.

The question has now proceeded a stage further owing to the increased attention paid to yellow fever in West Africa.

I have examined very closely the recorded outbreaks of yellow fever in West Africa, and it soon became abundantly clear that the so-called classical type of yellow fever was comparatively rare amongst the native races. In the various recorded epidemics the medical authorities of the time drew attention to the disproportion of the death-rate amongst blacks and whites. This fact was all the more remarkable as the natives far outnumbered the whites, and lived in notoriously over-crowded and insanitary conditions, and, as we now know, in an atmosphere crowded with the *Stegomyia*.

Why, therefore, if there was yellow fever on the coast of Africa, as was abundantly shown by the very numerous outbreaks amongst the whites, did no large epidemics occur amongst the black natives, and depopulate the West Coast? This is a very pertinent question and requires a very definite answer.

The West African blacks can get yellow fever, of this we have absolute proof, notably in the epidemics of yellow fever on the Coast in 1910. As far back as the epidemic of 1884 in Freetown,

a case of yellow fever was recorded in a native, and two cases amongst the black soldiers of the West Indian Regiment. In 1910, however, we have recent and positive evidence from the clinical histories and post mortem examinations. At Freetown, for example, one fatal case was recorded in a West Indian native soldier in July of last year, and also a fatal case in a native of Freetown. At Sekondi, in 1910, two cases amongst black men are recorded during the outbreak. In the two places there was a total of seventeen cases recorded amongst the white and five amongst the black residents. In October, 1910, according to Sorel, a small outbreak occurred at Grand Bassam, and three cases were recorded amongst natives. Therefore, it is beyond dispute that yellow fever can occur in its severe and fatal forms amongst the West African black races. This, then, corroborates the opinions of the older clinical observers that the black races were not absolutely immune. A new light, however, is thrown upon the problem by the 1909 epidemic of yellow fever in Barbados, which I was called upon to investigate. In this epidemic, yellow fever proved more fatal amongst the blacks than the whites. Out of a total of eighty-six cases, fifty-four occurred amongst the black inhabitants.

The blacks of Barbados are the descendants of the original imported African slaves; clearly, therefore, there was no hereditary racial immunity.

But why should the same race in West Africa appear to be immune? The answer to this question is the solution of the question of the presence of yellow fever in Africa. The Barbadian black lived in recent years under favourable conditions. The *Stegomyia*, there is every reason to believe, was greatly reduced in numbers by the introduction of a pipe-borne water supply laid on to the houses or to stand-pipes along the roads; puddles of water are not met with owing to the very porous nature of the soil, and the yards had been kept fairly free from odd water containers. There is practically no bush in the towns and villages, and the island is very much wind-swept. All these are factors which would tend to the diminution of the *Stegomyia*. The last recorded epidemic of yellow fever prior to the 1909 outbreak occurred in 1881, that is twenty-seven years previously. Therefore, it is reasonable to assume that yellow fever was not endemic on the island, and that

all those natives born since the 1881 epidemic were absolutely non-immunes. It is not surprising, therefore, that they became infected in those districts where the *Stegomyia* was present in sufficient numbers, and when the virus had been introduced into the island from without. The reverse is the case in West Africa.

The evidence, therefore, is conclusive—

1. That the negro can contract and die from yellow fever.
2. That he has, as a rule, yellow fever of a much milder type than that met with amongst whites who have recently arrived in a tropical country.

Naturally it follows that it is reasonable to ask: Does yellow fever occur amongst the natives of West Africa in a mild form, difficult of recognition; just as we know it did amongst the Creoles of the West Indies and the indigenous inhabitants of New Orleans, Cuba, Rio, Vera Cruz, Pará, etc.? In my opinion this is the only reasonable hypothesis which the facts will support and, moreover, it is one which has become formally adopted by those who have specially studied yellow fever, notably Marchoux and Simond, Otto and Neumann, Durham, and the American Cuban Commissions.

It is notorious that in places like Rio, Pará, and other endemic centres in the past, yellow fever was regarded as a disease of the foreigner or new-comer and not of the native; only the foreigners acquired the severe black vomit and died, the permanent inhabitants escaped. From the time of Faget, of New Orleans, up to the present date observers have, however, come to the conclusion that yellow fever does occur in the native children, and that it can occur more than once amongst adult natives. In other words, the natives suffer in early childhood and may suffer from subsequent attacks. We now can understand why fatal or severe yellow fever is rare amongst the native population—the natives are partially immunised. They contain the virus, nevertheless, in their blood, and can infect the *Stegomyia*. If, on the other hand, these same natives are removed in childhood from a yellow fever endemic area and protected, they become rapidly non-immunes, as shown above in the case of Barbados, and as has been proved many times amongst the Creoles and Indian-Spanish races.

The evidence is that yellow fever, like most other infectious diseases, does not confer permanent immunity. Also, that just as in other infectious diseases, mild ambulatory forms of the disease are probably far more common than is usually supposed. The outbreaks of yellow fever in West Africa last year, 1910, corroborates this view in a remarkable manner. From May to October there were five outbreaks of yellow fever, viz., at Freetown, Sekondi, Axim, Saw Mills, and Grand Bassam. In the case of four, at least, of these outbreaks no connection could be traced between them, they appeared to originate *de novo*. But more significant still, the first to suffer from the disease and to show the medical authorities that yellow fever was present were the Syrians, small traders who, with *their families*, live in the midst of the natives in the most Stegomyia-haunted parts of the towns. The 1910 outbreaks showed that those who lived outside the native towns remained absolutely yellow fever free. In my opinion, therefore, the evidence is overwhelming that yellow fever is endemic in West Africa, and that the reservoirs are the natives of West Africa. How far the natives of all coast towns in West Africa are reservoirs of the virus, I am not prepared to state, as we require more evidence, but the facts warrant us in stating that in many places, yellow fever is endemic amongst the native inhabitants in a particularly mild form, very much as malaria occurs amongst them. Unfortunately, we have so far no blood or animal test which will prove the presence of the virus, and have only to rely upon a severe case occurring in a non-immune to prove the existence of the disease. In West Africa the non-immune who serves as the test appears to be the Syrian, who happens to live most in contact with the native. From these facts it follows that the great practical lessons to be learnt are that segregation of the non-immunes and Stegomyia destruction are the absolute remedies against yellow fever, also that the answer to the question propounded in the beginning of this paper, viz., why have not the native races in the large towns been decimated or completely wiped out? is that they are completely immunised by mild attacks of yellow fever from childhood. It must also be borne in mind, however, that a considerable proportion of the infantile mortality in the native races may be due to mild yellow fever as well as malaria.

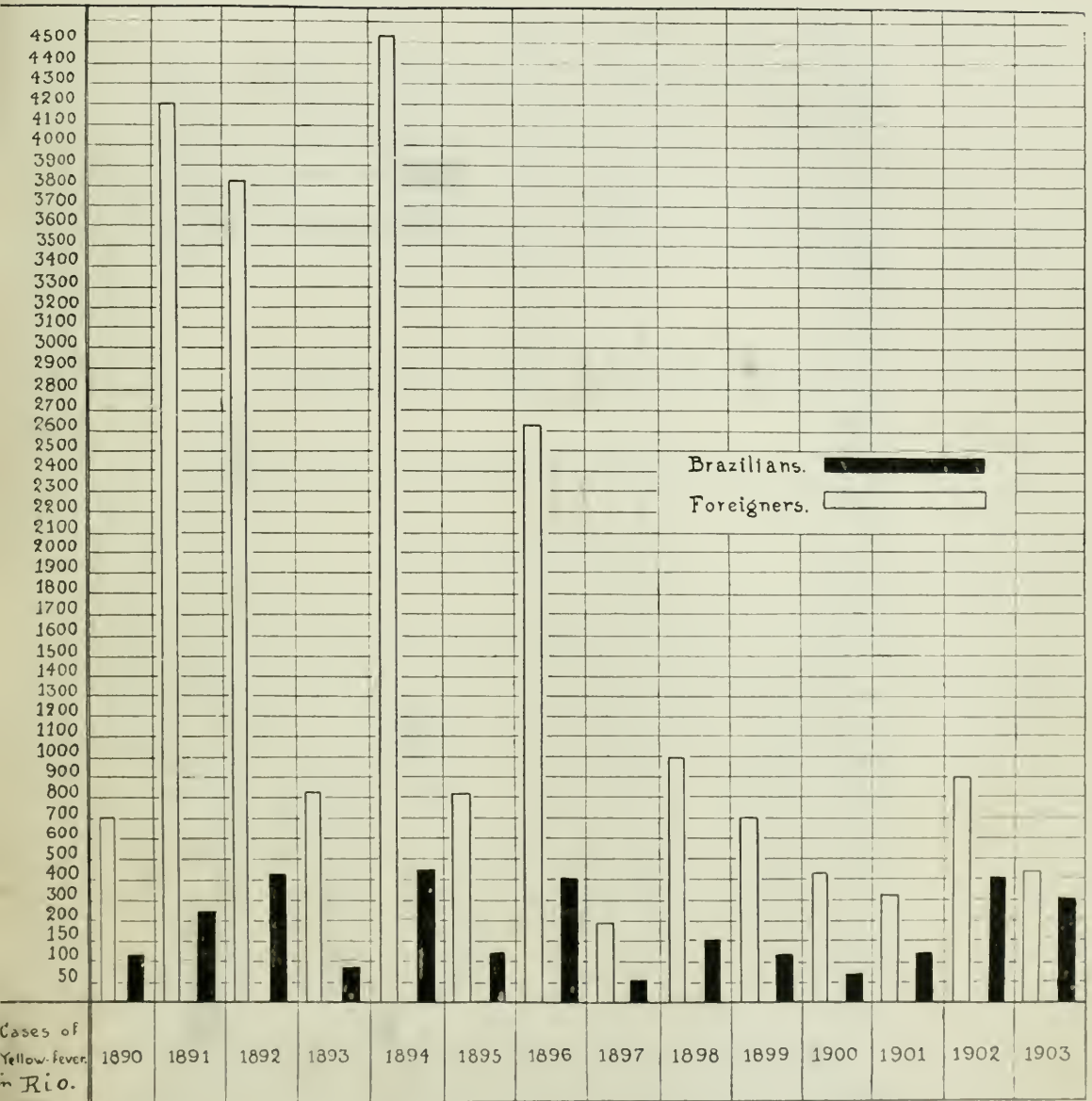


Diagram to illustrate the great difference between the cases of Yellow Fever amongst new arrivals, i.e. foreigners, and the native residents, i.e. the Brazilians in Rio. (Otto and Neumann.)

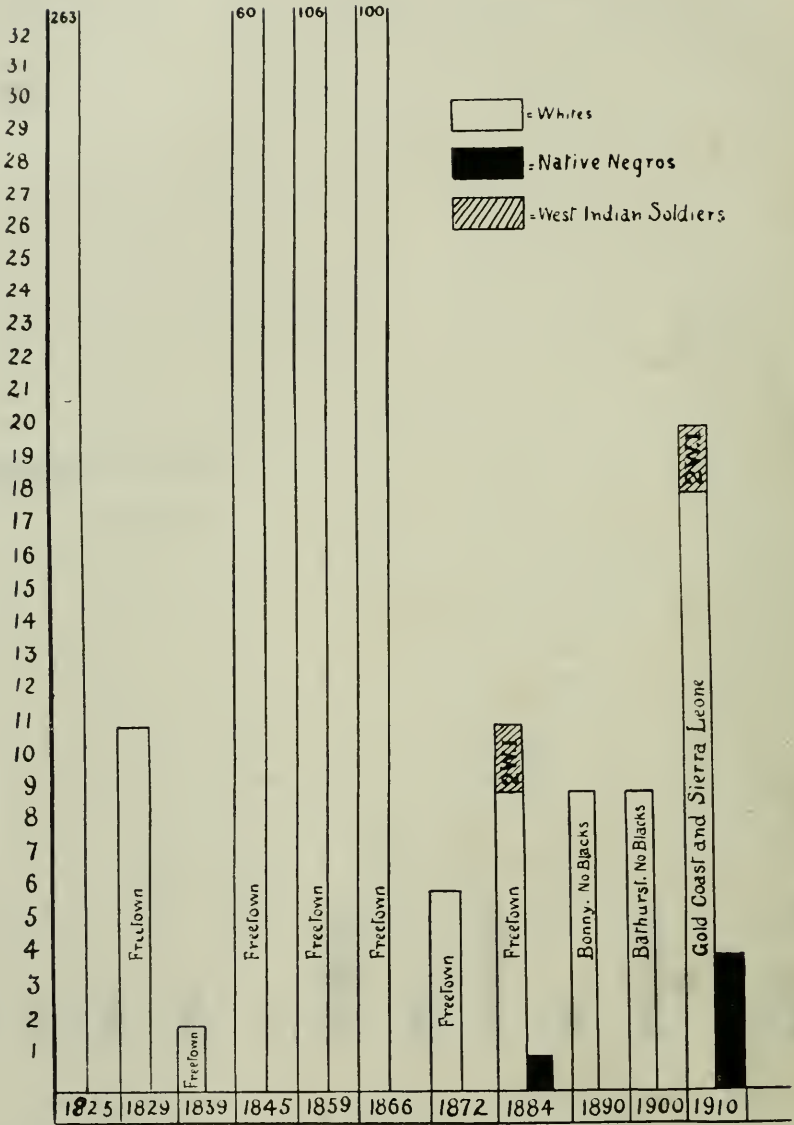


Diagram to show the chief outbreaks of Yellow Fever in British West Africa from 1825-1910. From the year 1884 the cases amongst the natives have been recorded. Note the marked difference between the whites and blacks respectively. Compare it with the Rio table.